

## REMARKS

This is in response to the Office Action dated July 24, 2008. Applicants respectfully request reconsideration and allowance of the application in view of the above-amendments and the following remarks.

### I. SPECIFICATION

The specification is amended to replace the term “less” with the term “more” in order to correct a typographical error introduced in the amendment filed March 26, 2002, and so that the specification matches the text of the original English translation that was filed with the U.S. National Stage.

### II. CLAIM REJECTIONS UNDER §102 AND §103

Claims 1-4, 6, 12 and 15-21 were rejected under §103(a) as being allegedly anticipated by Kober et al. U.S. Patent No. 6,252,535.

Claims 9, 11 and 14 were rejected under §103(a) as allegedly being unpatentable over Kober et al. in view of Applicant’s admitted prior art (AAPA).

Claims 8 and 13 were rejected under §103(a) as allegedly being unpatentable over Kober et al.

#### **A. Status of the Present Application**

1. The present application discloses a BFDM/OM modulation and demodulation technique, based on the implementation of a transmultiplexer structure. This transmultiplexer structure is composed of a bank of synthesis filters (in a modulation step) or a bank of analysis filters (in a demodulation step) having 2M parallel branches. Each branch of the banks of filters comprises an expander, respectively, a decimator of order M.

An important aspect of the claim 1, for example, is the ratio between the number of branches of the banks of filters ( $2M$ ) and the order of decimator or expander ( $M$ ).

2. In the first Office Action, the Examiner quoted a document (YEAP). In Applicant's response, Applicant explained that, not only was this document not concerning a BFD/OM type of modulation, but the structure of the transmultiplexer was also very different, the ratio not being implemented and, on the contrary, the number of branches being in the most equal to the order of expander/decimator.
3. In the second Office Action, the Examiner quoted a new document (KOB) and applied this document against most of the claims, although the new document failed to disclose the ratio  $M/2M$  recited in the present claims.

In a telephone interview with the Examiner, the undersigned attorney explained the claimed ratio  $M/2M$  to the Examiner.

#### **B. Content of the Third Office Action**

1. In this third Office Action, the Examiner indicates having taken into account Applicant's argument, but considers that, nevertheless, the document KOB would put into question the obviousness of claim 1, as well as most of the dependent claims.
2. The Examiner notes that KOB describes a structure of transmultiplexer, adapted notably to BFD/OM. He indicates that this transmultiplexer implements a bank of synthesis filters  $M$  (and not  $2M$ ) parallel branches, and a bank of analysis filters also including  $M$  parallel branches.

The Examiner notices that KOBER does not indicate that every branch of the analysis synthesis filters includes a decimator of order  $M$  or an expander of order  $M$ . Thus, he notes that it is not specified that the number of parallel branches is the double of the expander or decimator order, which is expressly recited in Applicant's claims.

3. However, the Examiner relies on lines 34-50, column 5 of the KOBER document, to underline that KOBER describes an order of decimation  $M$  ("M-fold decimation"), by carrying out a down-sampling, and that it would be obvious to adapt the sampling order to another value than  $M$ , according to the needs of the user...
4. Then, the Examiner discusses the patentability of most of the claims, that he considers also obvious, either in view of KOBER alone, or in combination with prior art described in the patent application.
5. As in the previous Office Action, the Examiner indicates that claims 5 and 7 are directed to patentable subject matter.

#### **C. Comments**

1. The Examiner acknowledged that the prior art he had identified does not disclose the particular ratio between  $2M$  branches and the  $M$  factor of decimation or expansion.

Applicants note that this particular choice was not obvious, and was not a "simple adjustment", obvious for a person of ordinary skill in the art.

2. First of all, it is advisable to insist on the fact that KOBER suggests, clearly and solely, that the number of branches must be equal to the factor of decimation or expansion (M). Even if it is the case, as he indicates, that the operation of decimation corresponds to a down-sampling, it does not seem correct to say, as he suggests, that this factor of down-sampling could be different from M.

On the contrary, the KOBER document suggests that the decimator/expander factor is and must be strictly equal to the number of branches of the banks of filters. Nothing incites, according to us, a person skilled in the art to consider that both values could be different.

3. On the contrary to what the Examiner indicates ("*However, it would have been obvious to one having ordinary skill in the art at the time of invention was made to adjust*"), modifying the rate of decimator and expander (N) so that it is different from the number of branches (M), is not obvious.

As a matter of fact, when one has  $M = N$ , the property of perfect reconstruction is available and desirable (see col.5, l.51-64).

If  $M \neq N$ , KOBER would have to build a new bank of upsampled filters with high performance. Nothing suggests that this is possible or desirable. For example, the description in connection with Fig. 21 (Cf. Col. 5, l. 64 to Col. 6, l. 20) applies only in the case of banks said to be in critical decimation  $M = N$ .

In the case  $N > M$ , the method does not function because matrices would not be square.

Furthermore, none of the references that he mentions suggests a solution. If at the time (and even now), KOBER had wanted to propose a solution of type  $N > M$ , at the very

least KOBER would have to have describes it as a minimum and explain why this choice was appropriate.

4. Moreover, KOBER does not disclose nor suggest the specific situation where  $N = M/2$ , which is not one obvious adjustment, but the very ratio giving its efficiency to the present application.
5. In fact, this is not what KOBER wishes to do.

The objective of KOBER is to obtain CNA and CAN compromising speed/precision as much as possible (col. 1, lines 60 to 65). To decompose the signal into sub-bands allows it to be on a weaker flow in every sub-band, the point being to work on critical decimation.

If he chooses  $N = M/2$ , he doubles the speed of processing with regard to the critical case, which goes against his objectives.

6. In other words:
  - Nothing in KOBER suggests the use a factor of decimator/expander different to the number of branches;
  - On the contrary, all the explanations and equations (notably, the square matrices) are specific to the case  $N = M$ ;
  - Choosing  $N \neq M$  goes against the objectives of KOBER, and is not suggested;
  - Besides, the particular case  $N = M/2$  of the invention is not suggested.

D. **KSR**

The claimed invention is not obvious unless there would have been, at the time the invention was conceived, a motivation or reason for a person of ordinary skill and creativity in the art to have combined or otherwise modified the elements disclosed or suggested by those references in the way recited in at least the independent claims. Applicant respectfully submits that the proposed reasons to modify provided in the Office action clearly exceed the scope of reasons to modify provided by the Supreme Court in *KSR International Co. v. Teleflex Inc. (KSR)*, 550 U.S. \_\_\_, 127 S. Ct. 1727, 82 USPQ2d 1385 (2007).

In particular, the Supreme Court in *KSR* said a person of ordinary skill in the art (POSA) “has good reason to pursue the known options within his or her technical grasp” when “[1] there is a design need or market pressure to solve a problem and [2] there are a finite number of identified, predictable solutions” (*KSR*, slip op. at 17; 82 USPQ2d 1385, 1397). The Court of Appeals for the Federal Circuit has since interpreted the second element of this to mean “a finite, and in the context of the art, small or easily traversed, number of options”, where subject matter outside that small, easily traversed number of options does not “support an inference of obviousness”. *Ortho-McNeil Pharma. v. Mylan Labs*, slip op. at 9-10, 86 USPQ2d 1196, 1201 (Fed. Cir. 2008). In *Ortho-McNeil*, the Federal Circuit found the claimed invention non-obviousness at several levels, where a POSA would not even have been likely to start where the inventor did, the POSA also faced too many unpredictable variables without a given reason to select among them as the inventor had, and the POSA would have had to explore properties far afield from the inventor’s initial purpose.

As discussed above, in view of *KOBER*, the POSA also faced too many unpredictable variables without a given reason to select among them as the inventor had. The modification from  $N=M$  to  $N=2M$  does not represent “a finite, and in the context of the art, small or easily traversed, number of options”. In fact, it goes against the express teachings of *Kober*.

Therefore, Applicant respectfully submits that the proposed reasons for modifying and/or combining the cited references far exceed the proper scope of reasons to modify and/or combine under the controlling precedents of *KSR* and *Ortho-McNeil*, and do not support a valid showing that the claims are obvious. Applicant therefore respectfully requests that the claim rejections under §103(a) be reconsidered and withdrawn.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By:           /David D. Brush/            
David D. Brush, Reg. No. 34, 557  
Suite 1400  
900 Second Avenue South  
Minneapolis, Minnesota 55402-3319  
Phone: (612) 334-3222 Fax: (612) 334-3312

DDB